

Subject: Science

Grade: Second

Standard: #2 The Nature of Science and Technology

Key Concept: People can often learn about things around them by just observing those things carefully, but sometimes they can learn more by doing something to the things and noting what happens.

Generalization: Working on a problem with a team helps us learn about the world around us.

Background:

Students have done some very simple investigations using observation, inferences, and forming conclusions based on data. Most activities have been teacher led with fairly predictable results. This is a first attempt at having different groups do different experiments that are more open-ended.

Students are given a pre-test to determine their placement. Students who have a good understanding of observation and inferences but need help with other science process skills should be placed in the basic tier. Students who understand observation, inference, prediction and have some concept of controlling variables should be placed in the grade level tier. Those who show mastery of the basic science process skills should be placed in the advanced tier.

There are several sources for ideas for open-ended investigations. One good source is the set of Puddle Questions for Science from Creative Publications. These are available for each grade, 2-6.

At each tier, you may choose to leave the activity open or provide more structure by adding specific directions. Students in the basic tier will need the most assistance with experimental design and actual carrying out of the investigation. The advanced tier should be able to figure out what they need without additional directions, and the grade level tier will be somewhere in between, depending on the students in that tier.

This lesson is tiered in *process* according to *readiness*.

Tier I: *Basic*

Does the size of a coin affect the number of drops of water it will hold?

Students are given a penny, dime, nickel, and quarter; an eyedropper; newspaper to cover desk; medicine dropper; and paper towels. Students first predict how many drops of water can be placed on a penny before the water runs off. Have them record their prediction. Students then carry out the experiment and record the actual number of drops. This should be repeated for two trials. Have students repeat the experiment with a different coin until all four coins have been used. Have them share their results with each other. Help them see the relationship between their predicted and actual value. You may want to find the average number of drops for them.

Tier II: *Grade Level*

This is from Puddle Questions for Science, Grade 2, ISBN:1-56107-842-5:

What can you do to a piece of paper to see how quickly it falls to the ground?

Tier III: *Advanced*

This is from Puddle Questions for Science, Grade 3, ISBN:1-56107-843-3:

Make a sand timer that measures exactly one minute.

Assessment:

Teacher observation and a completed investigation with supported conclusions are forms of assessment in this lesson.

The teacher may choose to have the different groups share what they learned with the other groups. You may do this as a whole class discussion or form triads of one student from each tier.

This activity is good preparation for the school science fair.